## Early Life Prebiotic effect on the intestinal microbiota composition and functionality

Azagra-Boronat I[1,2*], Massot-Cladera M[1,2], Castell M[1,2], Knipping K[3], Tims S[3], van't Land B[3,4], Stahl B[3], Knol J[3], Garssen J[3,5,] Franch À[1,2], Rodríguez-Lagunas MJ[1,2], Pérez-Cano FJ[1,2]

[1]Departament de Bioquímica i Fisiologia. Facultat de Farmàcia i Ciències de l'Alimentació. Universitat de Barcelona, Barcelona, Spain.
[2]Institut de Recerca en Nutrició i Seguretat Alimentària (INSA-UB), Barcelona, Spain.
[3]Nutricia Research, Utrecht, the Netherlands.
[4]University Medical Centre Utrecht/Wilhelmina Children's Hospital, Department of Pediatric Immunology, Utrecht, the Netherlands.
[5]Utrecht Institute for Pharmaceutical Sciences, Faculty of Science, Utrecht University, Utrecht, the Netherlands.
*Presenting author

***Background and objectives:***

Breast milk is an important source of a broad variety of bioactive factors that influence the intestinal immune system and microbiota development. The objective of this work was to study the effect of an Early Life Prebiotic (ELP) supplementation on the development of the intestinal microbial composition and its functionality in suckling rats.

***Methodology:***

Neonatal Lewis rats (n=16 per group) received either ELP or PBS (control) daily from 2nd to the 16th day of life. Changes in microbiota composition and functionality were evaluated on the 8th day of life by means of metagenomic and metabolomic analyses. In addition, immunological changes in intestinal structure of histological samples was also studied. Moreover, at the 16th day of life the concentrations of caecal short chain fatty acids (SCFA) as an indicator of microbiota functionality were quantified.

***Results and conclusions:***

ELP supplementation promoted intestinal development by increasing villus length and mucosal thickness. Profound changes were detected in specific microbial groups, such as an increasing proportion and diversity of Lactobacillus species. Regarding SCFA, although its total production was reduced, the relative proportion of butyric acid was increased in the ELP supplemented animals as compared to control.

In conclusion, the ELP influences the development of the intestinal tissue and microbiota, at both composition and functionality levels, suggesting its key role in early life.

***Acknowledgements:***

We would like to acknowledge Danone Nutricia Research for their financial support. I.A.B holds a research grant from the Ministry of Education (FPU15/02719).